CB2380 Medical Sensors 7.5 credits

Medicinska sensorer

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

Course syllabus for CB2380 valid from Autumn 2024

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Biotechnology

Specific prerequisites

Bachelor's degree in engineering or in sciences including 20 credits in mathematics and 15 credits in Physics, English B/6

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

After passing the course, the student shall be able to

- explain the fundamentals of medical sensor technology
- give an account of the physiological processes that are can be studied with medical sensor technology
- describe and explain the main technologies that are used in medical sensor technology with a focus on biosensor technology
- evaluate a sensor based on standard criteria and decide its suitability for specific medical applications.

Course contents

The course gives an overview of biosensor technology and its applications in medicine and health. The course also gives an understanding of the applications of biosensors in food safety, environmental monitoring and safety. Summary of contents:

- introduction to biosensors with an overview of economic importance and the multi-disciplinary aspects of sensor technology
- sensor principles and measurement technology for medicine and health
- transducers – electric/electrochemical, optical, mechanical
- biological recognition elements, including cells, DNA, RNA, and proteins (antibodies, enzymes, etc)
- surface functionalization
- micro and nanotechnologies in sensor science including fluidics
- test/individual – sensor interactions
- non-invasive and minimally invasive sensor technology
- criteria of sensor design and manufacturing processes
- analytical parameters for sensors
- multi-analytical methods

Examination

- LAB1 - Laboratory work, 4.0 credits, grading scale: P, F
- PRO1 - Project work, 1.5 credits, grading scale: A, B, C, D, E, FX, F
- TEN1 - Written exam, 2.0 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

If the course is discontinued, students may request to be examined during the following two academic years.

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.